INSTRUMENTS AND EXPERIMENTAL TECHNIQUES

Numbers 1-6, 1969

(A translation of Pribory i Tekhnika Éksperimenta)

Number 1 January-February, 1969

	Engl./Russ.	
Quality Measurements of Microwave Resonators (Survey)—V. A. Dvinskikh and Yu. P. Naumenko	1	5
NUCLEAR EXPERIMENTAL TECHNIQUES		
Design and Operation Characteristics of a Microtron with 17 Orbits—S. P. Kapitsa, V. N. Melekhin, B. S. Zakirov, L. M. Zykin, É. A. Luk"yanenko, and Yu. M. Tsipenyuk.	9	13
Operating Synchronization of a Compensator and an Accelerator and Stabilization of the Operating Level of the Compensating Magnetic Field—V. D. Tkachenko and A. M. Shenderovich	14	18
Investigation of Axially Symmetric Ion Beams—V. A. Teplyakov and V. I. Derbilov	17	21
Cerenkov Spectrometer for High-Energy Gamma Quanta and Electrons—V. S. Bekrenev, S. P. Kruglov, and A. I. Shchetkovskii	22	25
Measurement of Resolution Function of a Neutron Spectrometer—G. V. Muradyan, Yu. V. Adamchuk, and Yu. G. Shchepkin	26	28
Calulation of Radiative Correction for Electron Momentum—I. I. Pershin, N. N. Shishov, and Yu. P. Shkurenko	29	30
Using Thermostimulated Exoelectron Emission for Ionizing Radiation Dosimetry—A. I. Beskorskii, G. A. Zhegalina, and É. Ya. Goikhberg	35	36
Magnetostrictive Materials for Recording Information in Filmless Spark Counters—T. V. Bespalova, A. I. Golutvin, and Yu. V. Zanevskii	39	40
Joint Operation of a Spark Counter and an Ionization Calorimeter—N. Kh. Bostandzhyan, D. T. Vardumyan, G. A. Marikyan, K. A. Matevosyan, and A. P. Oganesyan	42	43
Scintillation Detector for X-Ray Radiation of Light Elements—V. R. Al'perovich, N. I. Komyak, and D. M. Khai	45	46
Boron-Loaded Plastic Scintillators—G. I. Anisimova, L. S. Danelyan, A. F. Zhigach, V. R. Lazarenko, V. N. Siryatskaya, and P. Z. Sorokin	48	49
Thermostable Film Isotactic Polystyrene Plastic Scintillators—A. V. Chernobai, A. I. Shepeleva, and L. E. Grudskaya	51	52
Alpha—Gamma Coincidence Spectrometer with a Proportional Counter and Silicon Detector—O. I. Grigor'ev and N. S. Shimanskaya	52	53
Stabilization of Amplification Factor of a Scintillation Neutron Spectrometer—V. G. Brovchenko, L. G. Kondrat'ev, N. S. Lebedeva, and V. M. Morozov	55	55
Instrument for Mass Analysis of Charged Nuclear-Reaction Products—V. K. Dolinov, V. S. Zazulin, and S. F. Niyakii	58	57
Errors Occurring in the Operation with Pulsed Radiation Sources and Counters Having an Extended Dead Time—A. S. Cherkasov, V. F. Borzhkovskii, I. I. Chkalov, and Yu. G. Mashkarov	63	62
Limiter Amplifier for Fast Coincidence Circuits—S. P. Sit'ko and V. A. Shevchenko	66	65
Automatic Background Subtraction—É. I. Podol'nyi and Yu. E. Selyaninov	68	67
Data Input Unit for Variable-Speed X-Y Recorder—A. M. Mazanova and A. P. Nekhai	71	69
Digital Data Accumulator for EPR Spectrometry—S. S. Batalin and A. M. Voronin	73	71

ELECTRONICS AND RADIO ENGINEERING

General-Purpose Pulse Shaper for Nanosecond Coincidence Techniques—A. A. Sanin and P. N. Shareiko 76 74
An Exponential Function Generator—Yu. D. Bespyatov and S. F. Semenov 82 80
High-Voltage Pulse Generator in the Nanosecond Range—V. M. Knyazev and V. A. Lyubimov . . 85 82
Pulse-Train Generator with a Phase-Controlled End of the Train—V. V. Marchenkov and A. P. Nekhai 87 84
Low-Current Logarithmic Amplifier—L. A. Vsevolozhskii, A. M. Ilyukovich, and I. P. Mikhailova 89 86
DC Electrometer Amplifiers for Mass Spectrometers—B. B. Leporskii, Yu. N. Zalesov, and V. I. Makarov 92 89
Transistorized IF Amplifier for Radiospectroscopy—V. A. Milyaev and A. V. Shirkov. 94 91
A Method of Measurement of Shift of Resonant Frequency of a Cavity—B. I. Ivanov 96 93
Frequency Stabilization of Microwave Oscillators in the Millimeter and Submillimeter Regions—Yu. A. Dryagin, A. F. Krupnov, L. M. Kukin, and V. A. Skvortsov 99 95
Adjustable Microwave Frequency Multiplier—F. F. Mende, V. M. Dmitriev, E. V. Khristenko, G. E. Churilov, and A. I. Korovyanskii 103 98
Automatic Frequency Tuner Attachment for GZ-14A Klystron Oscillator—O. T. Nikolov and L. D. Stepin 106 100
Measuring the Value of an Accumulated Charge in Semiconductor Radiation Detectors —O. V. Zakharchuk 108 102
Semiautomatic Spin-Echo Spectrometer for Ferromagnetic Materials—V. D. Kul'kov 111 105
Spin-Echo Spectrometer for Ferromagnets—V. B. Ustinov and L. A. Rassvetalov 115 108
Cryostat for Experiments on the Mössbauer Effect—V. A. Golovnin, S. M. Irkaev, R. N. Kuz'min, and L. G. Chachkhiani 118 111
Application of Coaxial Slotted-Line Method to Investigate Ferroelectric Materials in Centimeter Band when There Is Reflection Present in the Line—V. M. Petrov and V. E. Barboi 120 113
Measurement of Complex Permittivity in Decimeter Wave Region on the Basis of Transmission Factor—Chinmoi Das Gupta 124 117
Measurement of Combined Field Effect in Semiconductors—V. G. Litovchenko, V. P. Kovbasyuk, A. A. Sadovnichii, and A. P. Gorban' 128 120
Stabilization of Charging Voltage of Capacitive Energy Storage Elements of High-Power Pulsed Devices—A. M. Leonov and M. M. Ofitserov 132 123
A Transistorized Voltage Stabilizer of 50-220 V for an Inductive Load—V. E. Lyapukhov and O. P. Revokatov 135 126

GENERAL EXPERIMENTAL TECHNIQUES

An Ultrahigh-Vacuum Unit for Investigations into the Dissociation of Oxides—R. I. Garin, E. V. Glushachenkov, I. S. Kulikov, N. A. Mukhachev, M. G. Shakirov, and V. M. Shchedrin 137 128
Magnetron Manometer with Cold Cathode for Work in a Magnetic Field Which Varies in Direction—G. A. Nichiporovich and I. F. Khanina 143 133
Measurement of Molecular Fluxes by Means of Balance and Compensation Method —B. I. Semenov 146 135
Sealing of a Rotating Shaft—E. V. Rudnev 148 137
The Use of an Adsorption Pump for Repeated Evacuation of a Volume at a Constant Speed —A. L. Donde 151 141
Vacuum Seal for Transmitting Low-Force Displacements—V. Ya. Chekhovskoi and V. A. Petukhov. 153 142
Fundamental Amplitude Resolution of a Photomultiplier—A. E. Melamid and A. M. Potapov . . . 154 143
Attachment in Infrared Spectrometers UR-10 and UR-20 for Obtaining Spectra of Disturbed Total Internal Reflection—D. S. Bulatov 157 145
Composite Interferometer with an Electromechanical Scanning System—F. Ya. Ragimov and V. G. Koloshnikov 159 147

Light Shutter for Evacuated Spectrometry Apparatus—G. A. Katrich and D. T. Tarashchenko ...	162	149
74 Photometric Measurement of Electron-Diffraction Patterns of Gases—N. V. Alekseev, P. P. Barzdain, and I. A. Ronova ...	163	150
80 Apparatus for Excitation of Electrodeless Isotope Light Sources—D. I. Zorin, Ts. I. Glozman, 82 and Yu. N. Shestopalov ...	166	153
Improvement in Shadow Interference Fringe Method—V. S. Sukhorukikh and É. P. Kazandzhan..	168	155
84 Change of Difference in Phase between Wavefronts in Reverse-Circle Shift Interferometers —V. A. Komissaruk and V. I. Yanichkin ...	170	157
86 Study of the Time Constant of Photodetectors Using a Gas Laser—D. V. Tarkhin ...	172	158
Tunable Fabry-Perot Interferometer for Photoelectric Measurements—V. N. Lisitsyn ...	174	160
89 Magnetic Lens with Variable Field Distribution—B. P. Peregud and L. A. Cherstvov ...	175	161
91 Multichannel Apparatus for Remote Measurement of Constant Magnetic Fields—V. P. Kozin 93 and A. E. Tolstoi ...	179	165
95 Aluminum Solenoid for Producing Steady Magnetic Fields—P. P. Khokhlachev and M. A. Abdullaev ...	182	168
Miniature Hall Probe—S. G. Shul'man ...	184	169
98 A Synchronous Switch for Obtaining Strong Magnetic Fields of Sinusoidal Form —V. N. Bogomolov and S. G. Shul'man ...	185	171
100 Measurement of the Internal Friction Due to High-Frequency Transverse Oscillations 102 in Filamentary Crystals—B. Ya. Pines, V. M. Andronov, and V. B. Rabukhin ...	187	172
105 Comparative Quartz Dilatometer for Investigating Phase Transitions—L. A. Smolenko ...	191	176
108 Method of Studying Dynamic Stresses Due to Laser Radiation—V. A. Bulov and B. F. Ponomarenko ...	194	179
111 Use of Radioactive Sources of Soft X Rays for Measuring Thickness of Thin Coatings —S. I. Lobov ...	195	180
Measurement of Small-Angle X-Ray Diffraction in Fatigue-Loaded Samples—V. M. Knopov 113 and A. I. Slutsker ...	199	184
X-Ray Camera for Liquids—I. M. Shapovalov ...	202	186
117 X-Ray Pulse Generator—V. A. Grigor'ev and I. M. Obodovskii ...	204	188
Evacuated X-Ray Chamber for High-Temperature Processes—V. I. Babenko, V. V. Levitin, 120 V. A. Kravchenko, and A. A. Serebrennikov ...	206	189
Camera for Studying Crystal Substructure in a Diverging X-Ray Beam—T. A. Mingazin, 123 N. S. Ibraimov, and G. P. Rudnev ...	207	190
Thermionic Emission Characteristics along Cathode Surfaces—I. G. Kozlov, 126 V. G. Terpigor'ev, and N. N. Kuznetsov ...	209	192
High-Current Field-Emission Cathode—R. I. Garber, Zh. I. Dranova, N. A. Mansurov, and I. M. Mikhailovskii ...	213	196
Use of Presputtered Auxiliary Metals for Producing Ohmic Contacts of GaAs—Sn, GaAs—In, and GaAs—Pb—É. D. Prokhorov, V. A. Petrov, V. A. Shalaev, and V. N. Arendar' ...	216	198
128 Electrolytic Etching of Powerful Germanium p-n Junctions in a Pulse Regime —P. A. Kotsyumakha, V. G. Boiko, and A. R. Shelyag ...	219	202
133 Field-Ion Microscope with Improved Image Brightness—R. I. Garber, Zh. I. Dranova, I. M. Mikhailovskii, and G. G. Chechel'nitskii ...	221	204
135 Controlled Coaxial Discharger—L. Z. Gogolitsyn ...	223	206
137 Photoelectronic Microscope Attachment for Measuring the Coordinates of a Hole —A. M. Kirillov, S. F. Korndorf, and Yu. L. Polunov ...	224	207
141 Use of an N-102 Oscillograph for Converting a Linear Photorecording into a Record in the Form of a "Screen"—B. I. Legon'kii, V. G. Lyskov, and B. V. Naumov ...	226	209
142 Circuit for Etching Autoelectronic Emitters—G. N. Freiberg ...	228	210
143 Shutoff Valve for Very High Pressures—Ya. A. Kalashnikov ...	229	211
Membrane Differential Manometer for Operation in Aggressive Media—E. A. Golovskii, 145 V. A. Elema, and V. A. Tsymarnyi ...	230	212
Precision Angular Adjustment Mechanism—O. A. Akhvlediani, R. A. Kacharava, S. S. Sarkisian, 147 and D. A. Tasoev ...	231	213

Device for Thermal Evaporation of Heavy Metals—A. A. Aleksandrov and A. G. Kiselev 233 215
Vessels for Liquefied Gases Formed from Polystyrene Foam PSB—M. V. Vedernikov, V. A. Filippov, and L. I. Krivets 235 217
Device for Investigating Superconductivity under Pressures to 50 kbar—L. F. Vereshchagin, M. A. Il'ina, and E. S. Itskevich 237 219
Narrow-Gap Vacuum Insulation—A. I. Shal'nikov and T. A. Shal'nikova 240 221
Flexible Hose for Transfer of Liquefied Gases—N. Zyukin and A. I. Shal'nikov 241 222

DEPOSITED ARTICLES
Some Parameters of Vidicons on Exposure to Short Impulses of High Intensity—A. V. Petrakov, V. P. Gorokhov, and I. V. Lupakov 242 223
Effect of Chamber on Magnetic Field Parameters in the 6-GeV Electron Synchrotron—B. N. Zhukov and P. A. Fefelov 243 224
Program for Generation of a Fictitious Track—A. D. Makarenkova, V. I. Moroz, A. P. Stel'makh, and G. N. Tentyukova 244 225
Plant for Cleaning Working Gas of Spark Chambers with Fine Electrodes—I. A. Dukhovskoi, I. A. Radkevich, S. D. Sedoikin, V. V. Sokolovskii, and Yu. F. Tomashuk 246 226
Correction of Parameter Drift of a Spectrometer Unit by Processing Data on a Computer—A. T. Matachun, R. M. Musaelyan, I. V. Surkova, and I. V. Shtranikh 248 227
Storage Device for Signals of Microsecond Range—L. N. Gal'perin, L. B. Mashkinov, V. A. Benderskii, Yu. S. Shcherbinin, and A. G. Lavrushko 250 228
1024-Channel Magnetic-Resonance-Signal Accumulator—V. P. Zelenin, G. G. Kudymov, Yu. G. Svetlov, and V. A. Troshev 252 229
Determination of Absolute Age from C^{14} in the Presence of Contaminants—F. S. Zavel'skii 253 230
Automatic Stabilization System for the Scale of an EPR-Signal Time Averager—V. V. Tyapko, A. F. Chernyavskii, V. V. Chekalov, and S. S. Shushkevich 255 231
Extrema of the Differential Conductivity of a Nonlinear Resistor—E. E. Osipov 256 232
Determination of Some Tunnel-Diode Parameters—E. E. Osipov 258 233
Measurement of Small Currents Using Instruments with Integrators and Differentiators—Yu. N. Rodionov 260 234
Germanium Bolometer and Instrument for Measurements in the Far Infrared—V. V. Buzdin, A. I. Demeshina, and V. N. Murzin 262 235
Pulse Characteristics of FÉU-76 Photomultiplier with a Silver—Oxygen—Cesium Photocathode—L. M. Gurevich and G. A. Pyatnitskaya 264 236
Superconducting Direct-Current Electric Motors—L. D. Kolodeev 266 237

NEW DEVICES
Millimeter Wavelength Microwave Components—G. V. Denyuk, R. P. Siman'ko, V. P. Raevskii, S. P. Fominova, Yu. I. Efanov, É. D. Nemchenko, V. P. Zhaglo, and V. S. Garnat 268 238
Portable Apparatus for Measuring Electrostatic Charges—L. G. Gross and Yu. A. Petrov 270 239

ERRATUM 271

APPENDIX i

Number 2 March-April, 1969

Effect of Radiation Exposure on Field-Effect Transistor Parameters (Review)—V. Ya. Stenin 273 5

NUCLEAR EXPERIMENTAL TECHNIQUES
Multisectional Accelerating Tube—A. N. Serbinov 288 20

A One-Resonator Electron Accelerator—R. G. Kaminskaya, V. L. Kaminskii, V. V. Osipov, G. A. Uralov, and Yu. G. Yushkov 291 23
Reduction of Diffusion Resistance of Small-Aperture Accelerator Tubes—V. M. Tubaev and L. I. Pivovar 293 25
A Lithium Ion Source for a Cascade Generator—Ya. A. Teplova and V. G. Sukharevskii 295 27
A Mössbauer Spectrometer Based on the AI-256 Analyzer—B. N. Veits and Yu. D. Lisin 297 28
A Germanium Gamma Spectrometer—Yu. G. Degtyarev and V. N. Protopopov 302 33
Determination of Sensitivity of a Quantometer at Energies from 0.6 to 1.5 GeV—A. P. Komar, S. P. Kruglov, I. V. Lopatin, K. F. Mus, E. A. Filimonov, I. A. Grishaev, and B. I. Shramenko 307 38
Acoustic Spark Chamber for Recording Multitrack Occurrences—V. G. Vovchenko, B. M. Ovchinnikov, and O. Ya. Fedorov 310 40
The PK-300 300-Liter Bubble Chamber—A. I. Alikhanyan, A. S. Aleksanyan, N. Kh. Arutyunyan, B. I. Bekker, M. M. Veremeev, S. A. Kankanyan, R. L. Kavalov, É. Ts. Levonyan, and R. N. Pikhtelev 316 45
Spark Chamber with a Rotating Electric Field—M. I. Kozlov and N. S. Rudenko 319 48
Chambers for Use with Semiconductor Detectors—Yu. F. Rodionov and I. V. Naumov 322 51
Determining Characteristics of NaI(Tl) Crystal Detectors by Measuring Their Reflection Coefficient when Wrapped—N. Yu. Gurevich, Yu. A. Tsirlin, and A. Ya. Berlovskii 325 54
Detection Efficiency of Beta-Active Solutions with Scintillation Granules—V. M. Ékkerman, V. M. Solomonov, Yu. A. Tsirlin, and A. Ya. Gel'fman 329 58
Recording Low-Energy Protons with a Scintillation Counter—L. N. Bondarenko, B. G. Erozolimskii, and V. P. Zakharova 333 61

ELECTRONICS AND RADIO ENGINEERING

Determination of Counting Loss in Operation with Pulsed Sources of Radiation —V. T. Kotlyarov and R. G. Ofengenden 335 63
Increasing Speed of Response of an Amplitude Input Block for 4096 Channels—V. B. Ivanov and V. I. Shipilov 341 68
A Charging Device with Feedback for Amplitude-to-Time Conversion—V. V. Marchenkov and A. P. Nekhai 345 72
Counting-Rate Meter with Automatic Recording—N. I. Karabanov and A. I. Loksh 348 74
Stabilization System for Multidetector Scintillation Spectrometer—V. V. Mangoyanov, K. O. Oganesyan, M. N. Omel'yanenko, V. V. Fil'chenkov, and V. Khulubei 350 76
System for Tracking a Separated Beam of Secondary Particles—V. A. Korolev and Yu. V. Trebukhovskii 356 82
System for Automatic Gain Control of a Photoelectron Multiplier—E. M. Antoshchenko 360 86
Amplitude Discriminator with a Resolving Time of 5.5 nsec—M. N. Tsaregorodtsev and G. I. Borzunov 362 87
Oscillographing and Photorecording of Single Stage Processes at Centimetric and Millimetric Wavelengths—V. K. Adamchuk, A. N. Bukin, A. É. Isaev, and M. M. Filippov 366 90
Amplifying Equipment for Operation with A Superconducting Bolometer—I. A. Khrebtov 370 94
A Broadband Pulse Power Amplifier—V. D. Dvornikov, S. T. Latushkin, and L. I. Yudin 373 97
Generator Producing a Series of Pulses with an Exponentially Increasing Repetition Frequency —V. I. Kazachkov and I. V. Aref'eva 376 99
500 kV Nanosecond Square Wave Pulse Generator—G. A. Mesyats, V. V. Khmyrov, and V. P. Osipov 379 102
Formation of Random Pulse Sequence with a Given Law of Distribution of Intervals —N. M. Volchkov 382 105
Pulse Generator that Produces Pulses with an rf Carrier for Exciting Semiconductor Lasers —G. S. Grishaev and I. D. Mitsenko 384 107
Nanosecond Pulse Generators for Exciting Semiconductor Lasers—I. D. Mitsenko, G. S. Grishaev, and A. A. Dement'ev 386 108

Control of an IN-1 Tube by Means of Output Pulses from Ferrite-Transistor Stages—V. K. Petunin and M. A. Rad'ko	388	110
Input Units for Pyro Radiation Receivers—L. S. Kremenchugskii, A. F. Mal'nev, V. B. Somoilov, V. M. Stolyarov, and A. Ya. Shul'ga	389	111
Measuring Spatial Structure of a uhf Electromagnetic Scattering Field with an Analog Computer—V. V. Kovalev and V. S. Kozlov	393	114
Transducer for an shf Transferred Pulse-Power Meter—S. I. Gechyauskas, Yu. K. Pozhela, and K. K. Repshas	400	121
Stabilization of Total Balance of a Double-T Bridge Used in Nuclear Magnetic Resonance (NMR) Spectrometers—A. G. Kucheryaev, I. M. Ovchinnikov, and N. L. Oliferchuk	403	124
Instrument Determination of Duration Probability Distribution Density of the Fades of Random Processes—A. V. Blokhin	406	127
Observation of Spin-Echo Signals in Thin Ferromagnetic Films—V. B. Ustinov, S. P. Repnikov, S. L. Sokolov, and É. O. Saakov	409	130
Broadband Spectrometer for the Millimeter Range of Wavelengths—V. V. Meriakri and E. E. Chigryai	411	132
Recording Single Short Pulses by Means of a Perforator and a Recorder—S. V. Denbnovetskii, V. Ya. Zinchenko, and Yu. I. Cherevko	413	133
Quasi-Two-Channel Spectrometer for the Millimeter and Submillimeter Wave Regions—A. I. Zhukov, V. V. Meriakri, and M. M. Sharf	416	136
Quartz-Transducer Measurement of Thickness of a Growing Film—I. D. Voitovich, A. S. Polishchuk, and Yu. A. Snezhko	418	138
Multiplication of Two Signals in the Audio-Frequency Range with Averaging of the Results—G. S. Liubashevskii, A. I. Orlov, and V. É. Frishberg	420	139
A Simple Pulse Expander—V. N. Akimov, V. P. Yavorskii, and M. Z. Chapovskii	422	141
Recording Volt—Ampere Characteristics by Means of Single Sweep Pulses—A. M. Martsinovskii and B. I. Tsirkel'	423	142
Emission-Current Regulators—V. G. Danilov and A. P. Orekhov	425	143
GENERAL EXPERIMENTAL TECHNIQUES		
Method of Correcting Focusing of Magnetic Ion-Optical Systems by Means of Three Shaped Thin Shims—A. F. Malov, V. A. Suzdalev, and E. P. Fedoseev	428	146
High-Vacuum Demountable Ion Projector for Studying Radiation Damage—V. A. Kuznetsov, G. M. Kukavadze, and A. L. Suvorov	435	152
Method and Some Results of the Testing of Evacuation Systems of the PTI-7 Leak Detector—L. E. Levina and V. V. Pimenov	439	155
An Accurate Manipulator for Super-High Vacuum Instruments—V. D. Dvoichenko, V. F. Dvoryanko, A. Yu. Mityagin, and E. I. Vzatskaya	443	160
Simple Vacuum Seal for Use with Nonpermanent Joints—G. V. Grisha	446	162
Injectors and Ground Joints for Dosing Gases and Liquids—E. Ya. Alfimova, G. I. Zebakin, and V. R. Linde	447	163
Photoelectronic-Emission Background Current of Electronic Ionization Manometers with Magnetic Fields—E. A. Penchko	449	164
Measurement of Weak Flows of Charged Particles by Means of an Electron Multiplier and an Electrometric Amplifier—B. A. Mamyrin and V. I. Paleev	455	169
Photoelectronic Multipliers with Low Noise Level—G. M. Golkovskii, T. A. Kovaleva, G. Z. Kuptsova, and A. E. Melamid	457	171
Attachment for Single-Beam Infrared Spectrometers—I. V. Obreimov, N. A. Chumaevskii, and E. A. Shibalov	459	173
Modernization of IKS-11 and IKS-12 Infrared Spectrometers—V. M. Samorukov, N. A. Chumaevskii, and E. A. Shibalov	462	176
Improved Automatic Spectrophotometer Based on a UM-2 Monochromator—V. I. Kiis and U. Kh. Nymm	465	179
Standard Source of Ultraviolet Radiation—R. A. Nymmik	467	182

	Engl.	Russ.
Apparatus for Studying Semiconductor Lasers—Yu. A. Moma and M. V. Nevskii	469	184
Application of Phosphors to Visualization of Radiation from CO_2 Lasers—V. S. Arakelyan, N. V. Karlov, and S. A. Fridman	472	186
Measurement of Small Distances between Two Plane-Parallel Transparent Plates—P. E. Suetin, B. T. Porodnov, and M. B. Rafikov	474	188
Cell for Spectral Studies in Infrared Region at Pressures up to 50 kbar—Yu. A. Klyuev and L. S. Borshagovskaya	475	190
Chamber for Studying Mössbauer Effect at Hydrostatic Pressures up to 10 kbar—V. N. Panyushkin	478	193
Sealing of Small Piston in an Ultrahigh-Pressure Multiplier—M. A. Plotnikov, V. G. Novozhilov, and A. A. Antanovich	480	195
Apparatus for Slow-Electron Diffraction—V. F. Dvoryankin, A. Yu. Mityagin, V. D. Dvoichenko, and G. D. Balandin	482	197
Thermoluminescent Spectrometric Data Unit for X- and Gamma Radiation—K. M. Kudelin	485	200
Study of Photoluminescence of Crystals—V. L. Kuz'min, V. V. Vasilenko, and V. K. Bazhenov	488	202
Method for Providing Electrical Contact with a Glass-Insulated Microlead—V. Z. Shub	490	204
Depositing Silica Films by Hydrolysis of Silicon Tetrachloride Vapor—A. E. Bannikova, G. Ya. Podvigalkina, and G. I. Khalezova	492	206
Preparing Thin Targets of Separated Isotopes—G. N. Sleptsov and A. P. Solodovnikov	494	208
Depositing a Conducting Layer of a Metal on Its Oxide—A. G. Nepokoichitskii	496	210
Helium Cryostat for X-Ray Studies—A. I. Zakharov	498	212
Thermocontrol System for Crystallization Installation—I. V. Shevtsov, L. A. Kholodova, and V. A. Sokolov	500	214
Regulating Temperature in a Resistance Crystallization Oven—Kh. S. Bagdasarov, A. M. Kevorkov, and L. V. Prikhod'ko	503	217
ABSTRACTS		
Use of a Surface-Barrier Detector to Determine Gas Pressure—V. I. Vukolov, N. I. Gorelov, A. V. Mitrokhin, Yu. I. Pavlov, G. N. Subbotin, V. V. Sukhov, and S. V. Shtemberg	505	219
Deuteron-Beam Deviations in a 685-mm Isochronous Cyclotron—Yu. G. Basargin, R. N. Litunovskii, and O. A. Minyaev	506	220
Measurement of Electromagnet Characteristics at the 6 GeV Electron Ring Synchrotron—M. P. Vasil'ev, B. N. Zhukov, A. I. Kostenko, I. A. Mozalevskii, I. V. Mozin, Yu. S. Obidenko, V. P. Smirnov, P. V. Smirnov, and Yu. A. Toporikov	508	221
Electron-Pulse Gun with a Plasma Cathode—R. A. Demirkhanov, Yu. V. Kursanov, L. P. Skripal', and G. V. Kharin	510	222
Measuring Dead-Layer Thickness on a Silicon Surface-Barrier Detector—N. P. Podenko and É. K. Stepanov	512	223
System for Digital Computer Processing of Film Information from OIYaI Bubble Chambers—N. N. Govorun, V. I. Moroz, G. N. Tentyukova, and V. N. Shigaev	513	224
Punched Tape Recording of Results of Analog Measurements—B. S. Agrovskii, G. S. Lyubashevskii, B. D. Tartakovskii, and V. É. Frishberg	514	225
Construction of Single-Digit Binary Adder with Multiinput—A. Z. Podkolzin	515	226
Thyristor Computer-Converter of Number of Pulses in a Voltage—L. B. Mashkinov and L. N. Gal'perin	517	227
Five-Beam Oscillograph for Measuring Life of a Positive Pi (π^+) Meson—A. F. Dunaitsev and Yu. N. Simonov	519	228
Determination of Parameters of an Electron Moving in an Inhomogeneous Magnetic Field by a Method of Maximum Likelihood—G. I. Makarenko, V. I. Moroz, I. S. Saitov, and A. P. Stel'makh	521	229
Bubble Chamber Pressure-Measuring Mechanism with a Circular Thin-Walled Flat Capsule—N. M. Viryasov, Yu. D. Zernin, É. V. Kozubskii, V. A. Rusakov, and E. P. Ustenko.	523	230
Measurement of Average Number of Elementary Photoemissions Caused by Ultrasoft X Rays—E. P. Savinov, V. N. Shchemelev, and M. A. Rumsh	525	231

Binary Electron-Electron Resonance Spectrometer with a Spiral Resonator—E. A. Sokolov and V. A. Benderskii	526	232
Electroluminescent Semiconductor Element with a Controlled Luminous Field—A. A. Kal'nin, Yu. M. Tairov, and D. A. Yas'kov	528	233
Graded Cryostat for Maintaining Small Specimens at Temperatures Down to −196°C —V. G. Vasil'ev, N. V. Verein, and Yu. V. Leont'ev	530	234
He^3–He^4 Solution Cryostat for Temperatures of 0.03 to 0.016°K—K. N. Zinov'eva	532	235
NEW INSTRUMENTS		
I-4M Electron Beam Indicator—V. A. Zelentsov	534	236
Photographic Attachment FPI-4/10—V. A. Zelentsov	534	237
Radioisotope Relay Instrument RRP-1—V. A. Zelentsov	535	237
Small Nonlinear Electronic Simulator MN-7M—V. A. Zelentsov	536	238
Portable Electrical Laboratory Timer PV-53L—V. A. Zelentsov	536	239
Potentiostat P-5827	537	239
Errata	539	239

Number 3 May-June, 1969

Protection of Electronic Equipment and Measuring Systems from External Interference (Review) —K. É. Érglis	541	5
NUCLEAR EXPERIMENTAL TECHNIQUES		
Determination of the Current and Current Distribution in a Proton Beam—G. I. Dimov and V. G. Dudnikov	553	18
A 50-Kilovolt Electron Gun—L. K. Yakubovskii and E. Skladnik-Sadovskaya	555	20
High-Current Pulsed Electron Gun with High Perveance—N. S. Zinchenko, I. V. Lopatin, *and V. A. Sokolova*	558	22
Research on the Corona Triode of an Electrostatic Accelerator—D. Berets and P. Kostka	560	24
Integrated Reflection and Reflecting Power of a Crystal Monochromator—A. Z. Men'shikov, L. I. Novak, Yu. A. Dorofeev, V. G. Arkhipov, and S. K. Sidorov	564	28
The Use of a Ge(Li) Gamma-Spectrometer to Measure the Mass and Isotope Distributions of Fission Fragments—B. A. Gvozdev, S. A. Karamyan, N. S. Mal'tseva, Yu. Ts. Oganesyan, Yu. É. Penionzhkevich, A. M. Sukhov, B. V. Fefilov, *and Z. Sheglovskii*	570	33
Attestation of Beta-Ray Sources by Their Spectral Characteristics—É. K. Stepanov, *N. V. Tyutikov, and A. P. Ermilov*	575	37
Chamber for Investigation of Nuclear Reactions—N. I. Lukashunas and G. G. Semenchuk	580	41
Measurement of Relativistic Increase in Track Density in a Propane Bubble Chamber —V. K. Ermilova, L. P. Kotenko, and G. I. Merzon	583	44
Thermostatic System for a Wilson Chamber for Precise Measurements of Pulses—I. N. Fetisov.	586	46
Some Thermodynamic and Physical Properties of Mixtures of Bromine-Freon and Propane —G. S. Veselovskii, V. M. Golubchikov, N. S. Konoplev, and M. S. Khropov	591	50
Measurement of the Electron and Gamma-Quantum Energy Spectra in a Spark Chamber —V. A. Bezus, A. M. Gal'per, V. V. Dmitrenko, A. V. Kurochkin, B. I. Luchkov, *Yu. V. Ozerov, É. M. Shermanzon, and Yu. T. Yurkin*	593	52
Determination of the Ionizing Capacity of a Particle in a Spark Chamber with a Small Gap —*A. O. Agan'yants, G. A. Leksin, and V. M. Tiyunchik*	596	55
Flat Ribbon Microphone for Recording Several Sparks in a Spark Chamber—B. M. Ovchinnikov	599	58
Threshold Cerenkov Counters for Separating Particles in Clusters from the IFVE Proton Synchrotron—S. V. Donskov, V. A. Kachanov, V. M. Kut'in, A. I. Petrukhin, Yu. D. Prokoshkin, E. A. Razuvaev, and R. S. Shuvalov	602	60
Cerenkov Threshold Counter with a Radiator of Small Thickness—V. M. Kuznetsov, A. D. Onisko, and O. I. Stukov	607	65

	Engl./Russ.	
Plastic Scintillators with Increased Transparency—O. A. Gunder, S. A. Malinovskaya, A. R. Daich, and L. G. Teslya	609	66
Scintillators in Incomplete Optical Contact—Yu. A. Tsirlin, T. I. Sokolovskaya, M. E. Globus, and E. P. Mokhir	613	70
Sandwich Total-Absorption Counter—P. I. Golubnichii and A. P. Onuchin	617	74
Instrument for Registering Electrons with an Energy of 0.1 to 1.5 GeV in Cosmic Radiation —A. M. Gal'per, N. L. Grigorov, V. V. Dmitrenko, L. F. Kalinkin, V. G. Kirillov-Ugryumov, B. I. Luchkov, A. S. Melioranskii, Yu. V. Ozerov, I. A. Savenko, I. L. Rozental', and É. M. Shermanzon	621	78
Calibration of a dE/dx Counter by Means of Cosmic-Radiation Muons—S. G. Tonapetyan, O. G. Konovalov, M. T. Dorofeev, A. A. Zybalov, and A. I. Derebchinskii	627	83
Calculation of the Ranges of Heavy Charged Particles in Complex Material—V. I. Bad'in	629	85
Nomogram for Detectable Levels and Detection Accuracy for Small Activities—V. M. Malykhin and B. A. Golubev	631	87
ELECTRONICS AND RADIO ENGINEERING		
Multipurpose Pulse Generator for Testing Nuclear Spectroscopic Instruments—A. N. Volkov, I. V. Shtranikh, and N. V. Seregin	633	89
A High-Speed Inductive Frequency Variator—I. I. Averbukh and M. M. Karliner	637	93
Digital System for Maintaining Maximum Output Intensity of a Neutron Generator —L. P. Kolesnikov, A. M. Mazanova, A. P. Nekhai, and V. N. Slyusar'	639	94
Electronic Apparatus of a Four-Channel Telescope of Scintillation Counters—Yu. P. Antuf'ev and V. F. Chechetenko	643	98
Digital Transposer Based on a Ferrite Memory Block—F. M. Nagornyi and V. G. Obukhovskii	646	101
Using Analog-Digital Converters with Digit-By-Digit Weighting in Nuclear Spectroscopy —A. N. Volkov and I. V. Shtranikh	649	104
High-Speed Counter Using Tunnel Diodes and Transistors—A. N. Kozyr'kov and V. S. Romanov	653	108
Instrument for Measuring the Resolving Time of Coincidence-Anticoincidence Circuits —V. F. Chechetenko	656	111
Calculation of Pile-Up Distortion in Pulse Height Spectra—A. Pazman	658	112
Logarithmic Pulse-Amplitude Converter—V. I. Stepanov	662	115
Starting-Pulse Generator with High Interference Immunity—V. V. Polyudov, R. L. Rabinovich, and Yu. G. Fufachev	665	118
Pulse Modulator with Resonance Charging in the Relaxation Mode—D. G. Borisov, A. I. Gryzlov, and Yu. V. Belov	669	122
Transformers for Heavy-Current Nanosecond Impulses—B. M. Koval'chuk, V. V. Kremnev, and G. A. Mesyats	672	125
Low-Voltage Spark Peaker—O. S. Kolotov and V. A. Pogozhev	677	130
Monitoring the Shape of Pulse Peaks—V. B. Mufel'	680	133
Current Principle of Designing a Distributed Transistor Amplifier—A. D. Smul'skii	681	134
Transistor Amplifier for Measuring Weak dc Currents—M. A. Hasan and F. A. Grinevich	684	137
Broadband Synchronous Detector—N. S. Babenko and A. N. Sudarkin	686	139
Noncontact Current Probe—Yu. A. Bystrov and E. B. Isserlin	690	142
Photoelectric Spectrum Analyzer for a One-Shot Process—Yu. I. Nechaev and I. S. Shpigel'	692	144
Radiometer for the 4-cm Range with a Receiver Based on Tunnel-Diode and Parametric Amplifiers —A. B. Berlin, D. V. Korol'kov, and G. M. Timofeeva	695	146
Modulator for Power Modulation of SHF Oscillations—A. I. Zykov, B. R. Knyazev, and V. I. Smolin	698	149
Apparatus for Measuring the Energy Distribution of Electrons in a Gas Discharge—O. N. Oreshak and V. A. Stepanov	700	151
Control of the Current in the Electromagnet of an EPR Spectrometer—V. G. Zaletov	703	153
Use of Magnetic Amplifiers for Measuring and Stabilizing Large Direct Currents —B. D. Omel'chenko	707	156

GENERAL EXPERIMENTAL TECHNIQUES

Simultaneous Recording of Several Components in a Mass-Spectrometer with a Single Collector Mass-Analyzer—M. A. Pushkina and M. E. Slutskii	710	160
Ionization Gauges for Pressures from 10^{-10} to 10^{-1} torr—A. M. Grigor'ev, V. T. Grinchenko, I. A. Donskoi, and N. V. Tsybina	714	163
Multichannel Vacuum Spark Gap—A. I. Babaritskii, B. A. Demidov, S. D. Fanchenko, and V. V. Frolov	718	167
Determination of the Temperature Coefficients of Secondary Emission from Dynodes and of the Quantum Yield of Photomultiplier Cathodes—A. N. Pertsev, L. D. Soshin, and P. N. Talkach	721	169
Leak Simulator for the Calibration of Halogen Leak Detectors—A. I. Evlampiev, V. I. Karpov, and L. E. Levina	725	172
A Joint Between Artificial Sapphire and Metal—V. F. Popov, I. N. Kirsanova, and V. I. Presnov	728	174
Frequency Stabilization of a He-Ne Laser by Means of Low-Frequency Oscillations of Its Intensity—Yu. I. Zaitsev and L. A. Khurtin	731	177
AFC System for Locking Beat Frequency Between Two Lasers—I. P. Korshunov	734	180
Temperature Dependence of the Transmission Coefficient of a Sample Used in a Two-Beam Spectrometer—G. V. Yukhnevich	736	182
Improved Sensitivity of InSb and InAs Detectors—I. M. Nesmelova, T. L. Maslennikova, E. A. Nesmelov, and M. A. Validov	739	185
Determination of the Characteristics of Solenoids for Obtaining Strong Steady Magnetic Fields—L. V. Velikov, V. G. Veselago, M. V. Glushkov, V. M. Ivanov, Yu. V. Kosichkin, A. M. Prokhorov, E. G. Rudashevskii, and V. I. Chernykh	741	187
Developing an Electrostrictive Transducer for a Constant Magnetic Field—Yu. V. Afanas'ev, M. B. Grinbaum, E. M. Pevzner, and E. A. Petrov	743	189
Recording of the Lumen-Volt-Ampere Characteristics of p-n Junctions in a Logarithmic Scale—O. I. Gusakov and Yu. N. Nikolaev	746	191
Two-Probe Method of Measuring the Resistivity of Semiconductor Disks—E. P. Bernikov and A. L. Rvachev	749	194
Measurement of the Field Effect with Simple Compensation of the Capacitance Signal —R. N. Lovyagin	751	195
Cell for Measuring the Thermo-emf of Semiconductors in a Molten State —B. I. Kazandzhan	752	196
Determination of the Thickness of Epitaxial and Oxide Layers in Silicon by Interference Techniques—D. I. Bilenko, E. M. Ornatskaya, and Z. V. Shekhter	754	198
Forming of Metal-Semiconductor Contacts—V. Ya. Shevchenko and V. A. Skripkin	758	202
Deposition of Contacts on Semiconductor Crystal Surfaces—V. V. Slyn'ko, E. S. Nikonyuk, and V. V. Matlak	759	203

ABSTRACTS

Problems of Finding Malfunctions in Certain Systems of the U-120 Cyclotron—N. I. Sablin	760	204
Forming Meson-Channel Beams—A. V. Dem'yanov, A. A. Kropin, and V. S. Roganov	761	205
Program for Reaction-Channel Identification—Z. M. Ivanchenko, A. F. Luk'yantsev, A. D. Makarenkova, V. I. Moroz, and G. N. Tentyukova	763	206
Processing Recoil-Proton Spectrograms Taken from Isotropic Proportional Counters —A. K. Savinskii	765	207
Electronic Alpha-Particle Collimation for an Ionization Spectrometer Without Distortion of the Relative Spectral-Line Intensity—S. P. Vesnovskii, V. A. Vinokurov, and A. E. Trikanov	766	208
Method for Localizing Charged-Particle Tracks in a Spark Chamber with a Wide Discharge Gap—V. A. Mikhailov and N. S. Il'in	768	209
Analyzing Meson-Canal Beams with a Star Detector—V. G. Varlamov, Yu. M. Grashin, A. V. Dem'yanov, B. A. Dolgoshein, and V. S. Roganov	770	210

Semiconductor Charged-Particle Spectrometers—L. I. Barabash, V. G. Gonchar, G. N. Demidova, O. F. Nemets, V. N. Polyanskii, V. V. Alekseev, V. N. Dobrikov, V. V. Tokarevskii, and V. N. Shcherbin	772	211
Operation of a Cable-Connected Radiation Detector—N. S. Pronkin, V. V. Khakhalin, and V. K. Alekseev	774	212
Multipurpose Semiautomatic Microscope for Measuring Charged-Particle Tracks in Nuclear Emulsions—R. M. Raguzin, V. M. Rakitin, and N. M. Fedorova	775	213
Avalanche Transistors with Punchthrough in Nanosecond Pulse Circuits—V. P. D'yakonov	777	214
Avalanche Transistors in Sawtooth Voltage Generators—V. P. D'yakonov	778	215
Increase of the Dielectric Strength of Insulator Joints—V. K. Bocharov, S. I. Solodovchenko, G. A. Silenon-Bel'skii, and A. G. Dikii	779	216
Dual Time-of-Flight Mass Spectrometer for Plasma Analysis—N. I. Alinovskii	781	217
Mass Spectrometric Analyzer Determining the Particle Distribution of a Molecular Beam by Means of the Thermal Velocities—Yu. N. Lyubitov, Yu. A. Gel'man, A. M. Zatselyapin, V. I. Mikhailov, and L. V. Sumin	783	218
Use of the Trajectograph to Study Axially-Symmetric Electronic-Optical Systems Having a Longitudinal Magnetic Field—G. P. Prudkovskii and A. V. Khotina	784	219
Measurement of Weak Light Flux Pulses by Counting Photo-Electrons—V. I. Rykalin, S. K. Stolboushkin, V. P. Khromov, and R. S. Shuvalov	786	220
Transistorized Compensation Circuit for Optical-Acoustic Gas Analyzers—G. A. Grinev and V. F. Kostin	788	221
Free Suspension of Diamagnetic Polycrystalline Graphite Rotors in a Constant Magnetic Field—V. M. Ponizovskii and L. N. Rabinoch	789	222
Pantographic Mechanism for Parallel Displacement of a Wilson Chamber Piston —Z. Sh. Mandzhavidze, N. S. Rusishvili, T. I. Sharabidze, and A. Yu. Shtaerman	791	223
REVIEWS OF INSTRUMENTS		
Modification of the MI-1305 Mass Spectrometer Ion Furnace Source—S. P. Gordienko	792	224
Six-Pole Electromagnet for Focusing the Electron Beam in a Mass-Spectrometer Ion Source—V. V. Novitskii	795	226
Automation of Neutrographic Measurements in Photographing with an Alternating Magnetic Field—A. I. Kozlov and V. D. Parkhomenko	797	228
NEW INSTRUMENTS		
Wide-Range Oscillators for the Submillimeter Wavelengths—M. B. Golant, Z. T. Alekseenko, Z. S. Korotkova, L. A. Lunkina, A. A. Negirev, O. P. Petrova, T. B. Rebrova, and V. S. Savel'ev	801	231
Klystron Oscillator for the Three-Centimeter Range, Stabilized by a Superconducting Resonator—M. B. Golant, Z. F. Kaplun, Yu. V. Dedik, and K. P. Ivanitskii	802	232
Two-Channel Electrical Signal Spectrum Analyzer—N. F. Vollerner, V. G. Kriksunov, and O. P. Lyusenko	803	233
Very-Weak-Light Signal Recorder—A. N. Pertsev, É. I. Podol'nyi, I. V. Reznikov, Yu. E. Selyaninov, and V. E. Yamnyi	804	234
Short-Radio-Pulse Generator—V. D. Dvornikov, S. T. Latushkin, and L. I. Yudin	804	234
High-Voltage Hermetically Sealed Lead-In for Gas Detectors of Nuclear Particles —S. P. Mironov and Yu. L. Shitikov	805	235
Instrument for Exciting Semiconductor Quantum Generators—T. P. Varlamova, G. T. Kas'yanov, and G. S. Tetnev	806	235
Precision Adjusting Mechanism with Five Degrees of Freedom—L. I. Lagerev and V. I. Mar'in	806	236
Alignment Base for a Laser—L. I. Lagerev and V. I. Mar'in	807	237

	Engl.	Russ.
Experimental Methods of Investigating Alpha Radiation of Radioactive Nuclei (Review) —S. A. Baranov and V. M. Kulakov	809	5
NUCLEAR EXPERIMENTAL TECHNIQUES		
ILU Ion Accelerator to 100 keV with Separation of Ions by Mass—V. M. Gusev, N. P. Susharov, S. M. Naftulin, and A. M. Pronchiev	823	19
Current Measurement of Beams of Charged Particles by Use of Hall Effect—A. P. Shchelkin	829	25
Flame-Type Electron Source—G. N. Gridneva, V. I. Perevodchikov, G. G. Timofeeva, and K. A. Yumatov	831	27
Electrostatic Separator with Oxide Glass Semiconductor Cathode—V. A. Ergakov, I. I. Dryuchkov, Yu. V. Trebukhovskii, and V. A. Khar'yuzov	835	30
Spark Range Spectrometer for Electrons and Photons—A. G. Gapotchenko and B. B. Govorkov	838	33
Amplitude-Summing Compton Spectrometer—Yu. A. Zaitsev and L. I. Panteleev	841	36
Conversion of Pulse-Height Spectra Recorded by a Stilbene Crystal Into Energy Spectra —V. G. Dvukhsherstnov, A. T. Bakov, Yu. A. Kazanskii, and M. Z. Tarasko	845	39
Track Distortions in a Cloud Chamber—V. G. Denisova, A. M. Lebedev, and I. N. Fetisov	848	42
Properties of a Spark Chamber with Lead Electrodes for Recording High-Energy Electrons and Photons—A. M. Zaitsev, I. A. Radkevich, and Yu. F. Tomashchuk	852	45
Thin-Foil Electrodes for Large Spark Chambers—I. A. Dukhovskoi and I. A. Radkevich	857	49
Power Supply for a Stably Operating Streamer Chamber—N. S. Rudenko and V. I. Tsvetkov	859	51
Use of Topaz for Detection of Nuclear Fission—V. P. Perelygin and N. Kh. Shadieva	862	53
Double Ionization Chamber with an Increased Neutron-Flux Use Factor for Work with Accelerators—Yu. M. Artem'ev	864	55
Quenching Light Flashes in Liquid Scintillators with a Decaying Electric Field—L. Ya. Zhil'tsova, E. N. Matveeva, and M. N. Medvedev	866	57
Plastic for Cerenkov Detectors—M. A. Rubtsov, M. I. Frolova, and V. S. Chukin	868	59
Integral Cerenkov Detector for Determining the Intensity of Short Pulses of 8 to 20-MeV Electrons—G. A. Gumanskii, V. I. Kudin, and I. G. Tarutin	870	60
Sensitivity of Spherical Neutron Detectors below 10 keV—L. S. Andreeva, I. B. Keirim-Markus, L. N. Uspenskii, and I. V. Filyushkin	872	61
Low-Background System for Measuring Beta Activity—V. G. Volkov, N. I. Izotov, and B. S. Ratner	876	64
ELECTRONICS AND RADIO ENGINEERING		
System for Recording 32-Wire Spark-Chamber Information and Outputting it to a Digital Computer—L. S. Barabash, A. G. Grachev, L. V. Komogorova, V. D. Kondrashov, and N. M. Nikityuk	878	66
Intermediate Memory Based on Magnetostriction Lag Lines—V. V. Golushko, A. M. Shimanskii, and I. V. Shtranikh	882	70
Method of Designing a Buffer Memory—V. V. Puzanov and I. V. Shtranikh	886	74
Reversible Decimal Counter—Yu. V. Ovsov	890	77
Fast-Counting Register Using Tunnel Diodes and Transistors—V. T. Subbotin and K. É. Érglis	893	80
Duoplasmatron Current Generator—R. É. Bagdasarov	896	82
Stable Staircase-Voltage Generator—B. S. Ishkhanov, I. M. Kapitonov, I. M. Piskarev, and O. P. Shevchenko	899	85
Generator of Steep High-Voltage Pulses—K. M. Avakyan, F. V. Voskanyan, and É. G. Melikyan	902	87
Powerful Semiconductor-Based Nanosecond-Pulse Modulator—B. I. Morozov and É. I. Ordenko	905	89
Correlation Method for Measuring the Time Characteristics of Linear Pulse Devices Operating in the Nanosecond Range—Yu. V. Vvedenskii, D. A. Kabanov, and A. M. Siz'min	907	91

Increasing the Maximum Gradients in the Windings of the Pulse Transformers of Accelerator Foreinjectors—A. I. Babalin, G. R. Zablotskaya, I. M. Roife, and S. P. Yakovlev 911 94
Synchronizer for a Delayed Oscillograph Sweep Pulse from the Pulse Series Being Studied —N. K. Vishnevskii, V. I. Rykalin, and V. P. Khromov 916 99
Sensitive Modulation-Type Polarity Analyzer—L. A. Protopopov 919 101
High-Sensitivity Cascode Preamplifier for Infrared Radiation Receivers—V. P. Korotkov 922 104
Heterodyne Method of Frequency Measurement in the Millimeter Range—V. V. Kamyshan and R. A. Valitov 925 106
Spin-Echo Spectrometer Timing Circuit with Improved Stability of Pulse Repetition Frequency—F. V. Voskresenskii, A. Sh. Agishev, and V. N. Yastrebov 929 109
Semiautomatic Calibration of the Magnetic Field in the RÉ-1301 Spectrometer —G. I. Subbotin 931 111
Measurement of the Longitudinal Relaxation Time by Means of NMR Spectrometers —A. I. Zhernovoi and V. B. Lebedev 933 113
Garstens-Singer Shift in Recording a Nuclear Resonance Signal Using the Nutation Method —A. I. Zhernovoi 936 115
Reflecting EPR Resonator Having a Specimen Transport Mechanism—R. S. Maron and I. Z. Rutkovskii 938 117
Transistorized Circuit for Investigating Discharge Modes in Diodes—É. P. Busygin, V. G. Grigor'yants, B. G. Zhukov, and I. P. Yavor 940 119
Transition from Superconductivity to Normal Conductivity on Passing Alternating Current through Wires—V. N. Totubalin 943 121
Precision Temperature Controller—V. I. Eremenko and M. Kh. Shorshorov 946 124
System for Stabilizing the Rotation Speed of Mechanical Neutron Choppers—A. E. Golovin and A. P. Tsitovich 949 127
Stabilization of the Luminous Flux of Mercury-Quartz Lamps—V. P. Gorbachev, I. V. Krinskii, and D. I. Pashchenko 954 131
DC Stabilizer with an Increased Efficiency—K. D. Shmelev 956 133

GENERAL EXPERIMENTAL TECHNIQUES

RF Unipolar Mass Spectrometer—N. N. Bagrov, A. G. Furmanskii, and A. A. Guslyakov 959 136
Absolute Two-Beam Measurement of Isotope Ratios—V. A. Khalilov, T. V. Semenova, and B. M. Naidenov 962 139
Use of MI-1305 Mass Spectrometer to Study Ion-Sputtering Products—R. I. Marchenko, I. I. Stepko, V. F. Shkurdoda, and N. D. Antonyuk 964 140
Ion Source for the Production of Ions of Solids—I. V. Renskaya and O. A. Abramycheva 966 142
Ultrahigh-Vacuum Magnetron Ionization Gauge with Variable Operating Conditions —S. A. Vekshinskii and G. A. Nichiporovich 968 144
Electron-Beam Evaporators Having a Steigerwald Slit Optical System—V. P. Belevskii and V. M. Koptenko 970 146
Protective Coating on Heated Evaporators Obtained by Deposition from Vapor—B. I. Fomin and E. I. Cherepov 973 149
Electron Multiplier with Magnetic Focusing—A. M. Bronshtein 974 150
Pulsed Supply for Photomultipliers—V. V. Vorob'ev and N. I. Chernov 976 151
Magnetic Modulation of the Photomultiplier Current—P. I. Gos'kov and V. I. Lukovnikov ... 978 152
Investigation of the Time and Threshold Characteristics of a Photomultiplier —T. A. Dem'yanova, V. I. Markov, F. M. Subbotin, and E. I. Shubnikov 981 154
Time Fluctuations in the Pulses of FÉU-36 Photomultipliers—V. P. Kanavets, B. V. Morozov, N. A. Nikiforov, N. I. Potapov, and A. S. Starostin 984 157
Decreasing the Gain of the FÉU-30—V. V. Vorob'ev 988 160
Spectrum Analyzer for Light Modulators—B. V. Rakhaev and V. P. Trikoz 989 161
Local Precision Determination of Lattice Constants of a Single Crystal—V. I. Lisoivan and R. R. Dikovskaya 992 164

Three-Mirror Interferometer for Plasma Diagnostics in Transparent Gas-Discharge Cells —A. A. Bakeev, R. E. Rovinskii, and N. V. Cheburkin 995 166
Instrument for the Study of Laser Radiation—L. S. Kremenchugskii, A. F. Mal'nev, V. M. Stolyarov, and A. Ya. Shul'ga 997 167
Measuring the Lifetime of the Metastable Level in Neodymium Glass—E. M. Dianov 999 169
Measurement of the Mechanical Action of Laser Radiation—N. G. Kokodii and R. A. Valitov 1001 171
Elastic Transducer for Linear Displacements—L. M. Polyakov and G. N. Malik 1004 173
Miniature Magnetic System for Instruments Using a Hall-Effect Device or Magnetoresistance—Yu. V. Surin 1007 176
High-Power Pulsed Generator Producing Short Bursts of X Rays—K. F. Zelenskii, N. I. Zavada, I. A. Troshkin, and V. A. Tsukerman 1009 177
Pulsed Controllable X-Ray Tubes with Cold Cathodes—L. S. Eig, V. N. Dremin, and V. V. Latyshev 1012 180
Pulse-Type X-Ray Tube with a Hollow Anode—K. Bekturganov and G. A. Gumanskii 1015 183
High-Pressure X-Ray Camera for Taking Photographs at Temperatures down to 120°K —Z. V. Troitskaya, L. F. Vereshchagin, and S. S. Kabalkina 1017 184
Measurement of the Specific Electrical Resistance of Continuous Bodies of Various Shapes—A. A. Fomin 1020 187
Noncontact Method of Measuring Temperature Dependence of Electrical Conductivity of Semiconducting Materials—D. V. Iremashvili, N. I. Leont'ev, G. M. Mailov, and A. I. Shimko 1022 189
Measurement of the Intermediate Resistance of a Metal–Semiconductor Contact —V. V. Zaddé and A. K. Zaitseva 1025 191
Mounting of Whiskers for Galvanomagnetic Measurements—Yu. P. Gaidukov and Ya. Kadletsova 1027 193
Low-Temperature Resonators for Studying EPR through the Use of Single-Axis Pressure on the Specimen—M. M. Zaitov 1029 194
Annular Diamagnetic Suspension—V. B. Braginskii and V. I. Osika 1031 196
Use of Heat-Sensitive Paper for the Visual Detection of Radiation—V. A. Gorbunov and Yu. A. Yakobi 1032 197
Determination of Thickness of Coatings by means of Electrons Excited by a Gamma-Ray Source—L. P. Starchik and O. V. Yuzhnyi 1034 198
Obtention of Thin Films of Polyethylene by Evaporation in Vacuo—A. F. Perveev and G. A. Muranova 1036 200

ABSTRACTS

Mode of Accelerating d and He to Momenta of 11 and 22 GeV/c in the Synchrophasotron of the OIYaI—Yu. D. Beznogikh, L. P. Zinov'ev, G. S. Kazanskii, A. I. Mikhailov, V. I. Moroz, and N. I. Pavlov 1038 202
Multichannel Gamma-Spectrometer for Space Research—S. V. Golenetskii, V. N. Il'inskii, R. L. Aptekar', Yu. A. Gur'yan, E. P. Masets, V. N. Panov, and T. V. Kharitonova 1039 203
Synchronizing the Rotation Rate of a Neutron Chopper with the Frequency of a Pulsed Neutron Source—R. É. Bagdasarov 1041 204
Apparatus for Studying Photonuclear Reactions—Yu. M. Arkatov, P. I. Vatset, V. I. Voloshchuk, E. I. Vinokurov, V. L. Marchenko, and A. F. Khodyachikh 1043 205
Gas Convection in a Wilson Cloud Chamber—I. N. Fetisov 1045 206
Deformation of Nuclear Emulsions during Anomalies in the Final Drying of the Layers —V. I. Baranov 1047 207
Highly Efficient ^{3}He Neutron Counters—V. I. Korolev and V. G. Chaikovskii 1049 208
Highly Sensitive 4π Beta Flow Counter—V. V. Emel'yanov 1051 209
Experimental Determination of the Characteristics of the Peaks of Random Processes —A. V. Blokhin 1053 210

	Engl.	Russ.
Multichannel Statistical Analyzer of the Discrete Type—V. S. Sidenko	1055	211
Transistorized Coincidence Circuit—A. A. Rudenko	1056	212
Square-Wave Generators Using Avalanche Transistors—V. P. D'yakonov	1058	213
Synchronization Device for Simultaneous Use of a Storage Device with an NMR Spectrometer—Yu. D. Nechaev, Yu. L. Kleiman, and N. V. Morkovin	1060	214
Selecting the Parameters of Electromagnetic Rate Transducers for NMR Spectrometers—V. N. Bykov and A. E. Fedorovskii	1062	215
Study of the Characteristics of a Very-High-Vacuum Ionizing Magnetron Manometer —G. A. Nichiporovich	1064	216
Porous Leakers for Small Gas Flows—B. I. Semenov and Yu. V. Shamshurin	1066	217
Image Stability in an Ion Projector—A. L. Suvorov and G. M. Kukavadze	1068	218
Device for High-Temperature Roentgenography of Metals and Alloys —Yu. A. Kocherzhinskii, V. V. Pet'kov, and V. M. Pan	1070	219
Apparatus for Investigating the Electroluminescence and Sonoluminescence of Liquids —P. I. Golubnichii, V. D. Goncharov, A. N. Lukin, and Kh. V. Protopopov	1072	220
Ultrasonic Welding of a Metal Contact to a Semiconductor—A. I. Vital'ev, L. I. Ganeva, I. P. Golyamina, and O. V. Smolin	1074	221
REVIEWS OF INSTRUMENTS		
NMR Spectra of Fluorine Obtained on the YaMR-535 Nuclear Magnetic Resonance Spectrometer—É. G. Zotikov and V. L. Maksimov	1076	222
Work with Negative Ions in Industrial Mass-Spectrometers—V. A. Mazunov and V. I. Khvostenko	1079	224
Synchronization Circuit for a Spectrograph with Mirror Scanning of the Spectrum —I. V. Babin, G. I. Kromskii, and M. A. Plyshevskii	1081	225
NEW INSTRUMENTS	1083	227
ERRATA	1089	226

Number 5 September-October, 1969

	Engl.	Russ.
Designs of Ion Projectors (Review)—A. L. Suvorov	1091	5
NUCLEAR EXPERIMENTAL TECHNIQUES		
Method for Measuring the Instantaneous Coordinates of a Beam in an Accelerator Chamber —A. Z. Babayan, G. S. Vartanyan, I. P. Karabekov, and Yu. R. Nazaryan	1102	17
Condensers for Bending Beams of Charged Particles—L. L. Gol'din and S. V. Skachkov	1105	20
High-Frequency Negative-Ion Source—G. A. Gornitsyn, B. A. D'yachkov, and V. I. Zinenko	1110	24
Effect of the Thermal Inertia of the Cathodes on the Beam Current of Pulse-Type Electron Guns —D. A. Noskov and N. G. Pankovets	1114	27
Oil-Vapor Target for the Conversion of Atomic and Ion Beams—A. F. Sorokin	1116	29
Rotating Target for Obtaining Radioactive Isotopes in a Cyclotron—N. A. Konyakhin, N. N. Krasnov, and V. M. Tuev	1119	31
Stationary Targets for Obtaining Radioactive Isotopes in a Cyclotron—N. A. Konyakhin, N. N. Krasnov, and V. M. Tuev	1122	34
Apparatus for Investigation of the Photoproduction of π^+-Mesons on Hydrogen —V. M. Kuznetsov, O. I. Stukov, E. V. Repenko, and I. K. Zhankov	1126	37
Total-Absorption Cerenkov Gamma Spectrometer—V. I. Kryshkin and B. V. Shulik	1128	38
Filter of Second- and Third-Order Reflections for a Neutron Diffractometer—V. F. Petrunin	1130	40
Simultaneous Measurement of Mössbauer Spectra and X-Ray Diffraction Patterns —B. A. Golovin, S. M. Irkaev, and R. N. Kuz'min	1133	43
Introduction of a Gamma Beam into a Hydrogen Bubble Chamber—D. L. Bakashvili, M. S. Nioradze, R. G. Salukvadze, and V. Sh. Shvartsman	1135	44

Counting System for Visual Measurement Projectors with a 14-Digit Angle-Code Position Convertor—A. S. Burov, Yu. A. Karzhavin, V. M. Kotov, and I. I. Skryl'	1137	45
Multigap Spark Chamber for Fission-Fragment Detection—Yu. V. Ryabov and So Don Sik	1140	47
Checking of Thin-Foil Spark Chambers—I. A. Dukhovskoi, V. V. Kishkurno, and V. V. Kulikov	1144	51
Information Output System for Wire Spark Chambers—S. E. Baru, Yu. V. Korshunov, L. M. Kurdadze, A. P. Onuchin, and V. A. Sidorov	1145	51
Helium Multigrid Thermal-Neutron Detector—I. A. Karimov, Yu. L. Shitikov, M. G. Zemlyanov, and S. P. Mironov	1149	55
Performance Characteristics of Proportional Counters in the Ultrasoft X-Ray Region—V. N. Smirnov	1152	57
Testing of Semiconductor Surface-Barrier Detectors at Helium Temperatures—D. I. Tambovtsev and L. K. Kozlovskii	1155	59
Effect of the Method of Etching on the State of the Surface and on the Energy Resolution of Silicon Surface-Barrier Detectors—A. V. Protsenko, Z. I. Korol', and V. M. Korol'	1158	61
All-Metal Windowless Cells for Liquid Scintillators—A. N. Shutko	1161	64
ELECTRONICS AND RADIO ENGINEERING		
Eight-Channel Preliminary Memory System—B. S. Ishkhanov, I. M. Kapitonov, and I. M. Piskarev	1163	66
Spectrum-Area Measuring Adapter for the AI-256 Analyzer—V. F. Chechetenko	1166	69
Compensation of Pulses from Unpaired Input Signals at the Output of a Time-to-Amplitude Converter—K. N. Bakinovskii, M. Z. Protasevich, and A. F. Chernyavskii	1168	71
Indication of Flip-Flop States in a Ferrite Transistor Counter—A. I. Gartshtein and I. V. Filyushkin	1171	74
Pulse Control of IN-6 Glow-Discharge Indicator—R. D. Todesaite, V. A. Torgonenko, and F. M. Yablonskii	1173	75
Dose Conditions for a Functional Converter Circuit—O. A. Myazdrikov	1176	77
High-Voltage Nanosecond Pulse Generator with Compensation Using Nonlinear Components—V. G. Bagramov, D. V. Iremashvili, A. I. Kolesnikov, and N. I. Leont'ev	1179	80
Modulated High-Voltage Generator—P. E. Molotov, M. P. Men'shikh, and V. A. Mednikov	1182	82
High-Voltage Gas-Filled Spark Gap—V. N. Ishchenko and V. N. Starinskii	1185	85
Four-Channel Unit for Firing Spark Gaps Synchronously—V. N. Rybin, V. N. Cherepanov, N. I. Zinchenko, and V. A. Stepnov	1187	86
dc Amplifier for a Cathode-Ray Beam—V. A. Tsar'kov, B. A. Levinson, V. A. Pavlenko, and N. N. Voronin	1189	88
High-Power Radio-Signal Attenuator with Digital Control—S. A. Gavrilyuk, L. M. Dykhnenko, B. V. Mushchinskii, and V. A. Shchegolev	1191	90
Traveling-Wave Maser with Improved Gain per Unit Length—G. S. Misezhnikov, M. M. Mukhina, and V. B. Shteinshleiger	1193	92
Pyroelectric Detector for a Quasi-Optical Communications Link in the Millimeter Waveband—A. N. Akhiezer and V. I. Il'yashenko	1195	93
Two-Channel Amplifier for a Radiometer with Zero Intermediate Frequency—P. A. Kapustin and A. A. Petrovskii	1199	97
Low-Noise Amplifier for 410 MHz—P. A. Kapustin and A. A. Petrovskii	1202	99
Measurement of Weak Low-Frequency Signals—Yu. A. Blyumkina and Yu. G. Nikolaev	1204	101
Linear Voltage-to-Frequency Transformer—V. I. Prokopenko	1206	103
Conversion of Graphic Information—A. A. Yakomo	1209	105
Panoramic Adapters for the Analysis of Wideband Spectra in the High- and Superhigh-Frequency Bands—I. S. Fishman and N. P. Mukhortov	1214	110
Determining the Volt-Ampere Characteristics of Discrete Processes of Short Duration—U. A. Arifov, V. V. Kazanskii, V. B. Lugovskoi, and V. A. Makarenko	1218	114

		Engl./Russ.
Alternating Magnetic-Field Induction Meter Utilizing the Hall Effect —I. L. Vinnikov and V. I. Katamadze	1221	116
Magnetic-Field Stabilizer Based on Paramagnetic Resonance—B. F. Alekseev and B. E. Sobotkovskii	1225	119
Electromagnet Current Stabilizer—M. M. Karliner, B. V. Levichev, A. S. Medvedko, and N. V. Shustrov	1228	122
Electromagnet Current Stabilizer—V. E. Lyapukhov, G. V. Ostashov, and O. P. Revokatov	1231	124
Variable Current Stabilizer for 500 A—G. D. Porsev and V. N. Slyusar'	1233	126
Current Stabilizer with a Wide Range of Control—V. A. Skubko and G. A. Kutya	1236	129
Monitoring Film Thickness in the Course of Deposition—A. G. Logvinenko and Yu. A. Blyumkina	1238	130
GENERAL EXPERIMENTAL TECHNIQUES		
Increasing the Resolving Power of the MI-1305 Mass Spectrometer—V. M. Kel'man I. V. Rodnikova, M. L. Uteev, and P. A. Finogenov	1240	133
Ratiometric Measuring Attachment for the MI-1101 Mass Spectrometer —V. V. Novitskii, N. I. Kuptsov, and S. S. Komlev	1243	136
Obtaining Reproducible Mass Spectra of Liquids for Vacuum Diffusion Pumps —É. F. Chaikovskii, L. A. Taranenko, and D. V. Sheinert	1246	139
Use of Photoelectron Multipliers to Amplify the Output Signal of Cesium Tubes for Atomic Beams—I. I. Samartsev, T. N. Tager, and Ya. A. Yukhvidin	1248	140
Periodic Scanning in a Photoelectron Recording System for Research on Very Fast Light Processes—V. B. Fedorov, A. A. Novikov, and A. A. Sharypin	1250	142
Research on Frequency Characteristics of Photoelectron Multipliers Using Injection Light Sources—A. M. Potapov, L. Z. Rutkovskii, and N. N. Shavel'	1253	145
Generator of Nanosecond Light Pulses on Gallium Phosphide—Yu. L. Il'in A. N. Pikhtin, and D. A. Yas'kov	1255	147
Visual Observation of 10-μ Laser-Radiation Field Pattern—A. F. Krupnov and L. A. Sinegubko	1258	149
Method for Joining Optical Quartz Parts with Polished Surfaces—V. M. Orlov and I. A. El'kina	1259	150
Manufacture of Cylindrical Metal Mirrors—V. O. Losev and N. N. Ryzhov	1261	151
Light-Divider for a Double-Beam Spectrophotometer—V. N. Larionov	1263	152
High-Sensitivity Cooled Superhigh-Frequency Hall Pickup—V. S. Aksenova, L. Kh. Antropova, V. V. Galavanov, and N. V. Kotosonov	1265	154
Double Solenoid with a Homogeneous Pulse Magnetic Field —I. I. Ushakov	1267	155
Generation of a Strong Pulsating Magnetic Field in a High-Pressure Chamber —I. G. Fakidov, R. Adiatullin, E. S. Itskevich, and V. A. Sukhoparov	1269	157
High-Pressure Chamber for Measuring the Intensity of Magnetization Using Pendulum Balances—Yu. S. Versenev, N. P. Grazhdankina, and M. I. Oleinik	1271	158
Miniature Transducer for Measuring Small Dynamic Forces—V. I. Zarkhin, I. A. Levtov, and A. M. Él'gard	1273	160
Contact Sensing Element for Angular Displacements—I. V. Naumov	1276	163
Two-Speed Reducer for Recording Information on Magnetic Tape—V. V. Dobyrn, A. V. Monakhov, A. I. Platunin, and M. V. Stabnikov	1278	164
Measurement of the Amplitudes of the Ultrasonic Vibrations of Solids —Kh. G. Bogdanova, Yu. V. Vladimirtsev, V. A. Golenishchev-Kutuzov, and N. A. Shamukov	1280	166

Demountable Sharp-Focus X-Ray Tube with a Divergent Beam—E. A. Levikov and L. V. Levikova 1283 168
Observation of the Domain Structure of Ferromagnetic Films in the ÉM-7 Electron Microscope—L. I. Chernyshova and G. I. Belik 1285 170
Obtention of Thin Silicon Crystals for Electron-Microscopic Investigations by Photolithography—Yu. P. Boitsov, V. I. Prokhorov, and L. M. Sorokin 1287 171
Preparation of 0.5-μ-Thick Germanium Single-Crystal Specimens—S. V. Kopylova, É. A. Klimenko, and A. G. Klimenko 1290 174
Measurement of Impurity Distribution along the Depth of Silicon Epitaxial Layers—Yu. P. Boitsov, V. I. Prokhorov, and V. T. Mashekhin 1292 175
Measurement of Electron Work Function of Metals and Semiconductors in Ultrahigh Vacuum—L. Cyrnev, G. Bliznakov, and Iv. Lilov 1295 178
Method of Studying the Kinetics of Photoconductivity of High-Resistance Semiconductors and Dielectrics—V. L. Aver'yanov and V. M. Lyubin 1299 181
Instrument for High-Temperature Investigations of the Electrical Conductivity and the Hall Effect in Semiconductors—Yu. V. Rud' and K. V. Sanin 1301 182
Contactless Method of Measuring the Conductivity of Semiconductors—N. I. Dimov, Yu. E. Kaigorodov, A. V. Kozlova, V. A. Presnov, and G. K. Skomorokhova 1303 184
Precision Isostatic Temperature Control Device—Ya. V. Vasil'ev, A. F. Neermolov, V. A. Gerasimov, and G. V. Kononova 1306 187
Temperature Self-Stabilization in a Thermostat with VO_2 Heaters—V. N. Novikov and B. A. Tallerchik 1310 190
Temperature Stabilization in the Range 77-250°K—S. V. Mironov, E. G. Rudashevskii, and V. I. Chernykh 1312 192
Cryostat for Dissolving ^{3}He Used in the Investigations in the Region of 10^{-6}°K—V. P. Peshkov 1313 193
Cryostat for Measuring Electron Paramagnetic Resonance (EPR) at 2 to 300°K—V. A. Moiseev, A. M. Pshisukha, and A. I. Zvyagin 1317 197
Gauge for Measuring Liquid Helium Level—V. S. Egorov 1319 198

ABSTRACTS

Differential Double-Beam Spectrophotometer Based on Spectrophotometer SF-2M—A. Yu. Borisov, R. N. Ivanovskii, and V. N. Larionov 1321 200
Theory of Transition into Synchrotron-Operation Acceleration—F. K. Aliev and E. M. Moroz 1323 201
Evaluation of Tolerances in Manufacture of Sectional Accelerating Tubes with Inclined Fields—A. N. Serbinov 1325 202
Quasimonochromatic Polarized Photons Obtained at the Electron Linear Accelerator of the Physicotechnical Institute of the Academy of Sciences of the Ukrainian SSR—Yu. V. Zhebrovskii, L. Ya. Kolesnikov, I. I. Miroshnichenko, S. I. Naisteter, A. I. Rubashkin, P. V. Sorokin, R. O. Avakyan, and L. G. Arutyunyan 1327 203
Instrument Measuring the Current Density Distribution in Pulsed Electron Beams—A. I. Gerasimov and V. P. Tsarev 1329 204
Measurement of Secondary-Electron Spectrum by Time-of-Flight Method—D. K. Daukeev and S. Ya. Lebedev 1331 205
Emulsion Method of Determining the Angular Distribution in the Scattering of Fast Neutrons (~14 MeV)—G. E. Belovitskii, L. N. Kolesnikova, L. V. Sukhov, and T. A. Romanova 1333 206
Limits of Measurement of a Beta-Particle Flux against a Gamma-Ray Background—I. B. Keirim-Markus and L. N. Uspenskii 1335 207

Set of IKS-A Glass Gamma Dosimeters for Detecting Hazardous Radiation Doses —I. A. Bochvar, A. A. Vasil'eva, T. I. Gimadova, A. S. Egorov, I. B. Keirim-Markus, P. N. Kiselev, A. Ya. Kushnerev, G. M. Petrov, N. A. Sergeeva, and V. V. Yakubik 1337 208

Operation of Ionization Converters in Low Vacuum —V. T. Grinchenko 1339 209

Detector Using a Dielectric Scatterer—G. F. Ioilev and V. A. Safonov 1341 210

Experiment in Operation of Semiautomatic Units for Measuring Photographs of Chambers—V. N. Kapustina, I. S. Mar'in, I. P. Polushko, N. A. Protsenko, N. M. Rodionov, V. D. Stepanov, and T. F. Todorenko 1343 211

Apparatus for Measuring Energy Spectra with the "Minsk-22" Electronic Computer —V. G. Vovchenko, R. Ya. Zul'karneev, S. V. Medved', V. V. Moiseeva, V. S. Nadezhdin, B. M. Ovchinnikov, E. B. Ozerov, O. Ya. Fedorov, G. Yu. Tsakher, and N. A. Chistov 1344 212

Pulse Amplitude Analyzer for Charged-Particle Spectroscopy—L. S. Aleksandrov, Yu. P. Gordeev, V. N. Lutsenko, Yu. V. Mineev, and V. F. Shcherbakov 1346 213

Economical Counter Decade with Indicator—M. I. Lerner, A. G. Ryzhevskii, and V. M. Shlyandin 1348 214

Use of ÉM-6 and ÉM-9 Electron Microscopes as Scanning Microscopes —V. M. Krygin and Yu. V. Chentsov 1349 215

REVIEWS OF INSTRUMENTS

Recording the Results of Measurements Made with the ChZ-12 Frequency Meter —V. N. Smirnov 1351 216

G4-1A Generator Pulse Modulator—I. I. Perepechko and V. E. Sorokin 1353 217

Improvement of the Measurement Section of the MI-1305 Mass Spectrometer—R. E. Prilutskii 1355 218

Mounting of Two BSV-7 X-Ray Tubes on a URS-60 Apparatus—V. I. Gerasimov and D. Ya. Tsvankin 1357 220

NEW INSTRUMENTS

Temperature Attachment for a Small-Angle X-Ray Chamber—V. I. Gerasimov 1359 221

UMV-0.0005 Ultramicroscales—V. A. Zelentsov 1359 221

Device for Recording Analog Signals on Punched Tape—N. F. Goroshkov and G. N. Savaev 1360 222

UID-T General-Purpose Deformation Meter 1361 222

Number 6 November-December, 1969

Elimination of Distorted Signals in Amplitude Spectrometry (Review)—V. B. Ivanov, A. M. Shimanskii, and V. I. Shipilov 1363 5

NUCLEAR EXPERIMENTAL TECHNIQUES

Conversion of the Institute of Theoretical and Experimental Physics (ITÉF) Proton Synchrotron to Operation with a 25 MeV Linear Accelerator as Injector—L. Z. Barabash, V. A. Batalin, M. A. Veselov, L. L. Gol'din, P. R. Zenkevich, I. M. Kapchinskii, D. G. Koshkarev, N. V. Lazarev, Yu. Ya. Lapitskii, P. I. Lebedev, K. K. Onosovskii, and V. K. Plotnikov .. 1371 14

Acceleration of Lithium Ions in a Cyclotron—P. I. Vasil'ev, N. I. Venikov, D. V. Zevyakin, A. A. Ogloblin, N. N. Khaldin, B. I. Khoroshavin, V. I. Chuev, and N. I. Chumakov 1374 16

Wedge-Shaped Detector for Measuring the Position and Profile of Particle Beams —S. V. Donskov, Yu. D. Prokoshkin, and R. S. Shuvalov 1376 18

Increasing the Reliability and Efficiency of the Cathode Unit of a Betatron Injector —V. V. Ékivin and N. I. Ékivina 1380 21

Generator for Negative SF_6 Ions—S. G. Konstantinov 1382 23

Apparatus for Irradiating Tablets with a Horizontal Beam of Charged Particles—L. P. Eremin and A. N. Oblivantsev	1384	24
Pulsed Gas Target for Neutral-Atom Detection—A. F. Sorokin and F. A. Tsel'nik	1386	26
Apparatus for Measuring the Parameters of Nuclear Fission for 0.7 to 7 MeV Neutrons—M. V. Savin, Yu. A. Khokhlov, Yu. I. Il'in, and Yu. V. Shein	1388	27
Possibility of Analyzing a Spectrum during the Actual Recording Process—A. V. Borovikov	*1391*	*30*
Operating Conditions of a Bubble Chamber Filled with Bromine Freon—I. A. Danil'chenko, *E. P. Kuznetsov, and E. A. Parshin*	*1395*	*33*
Large Transparent Table for Processing Photographs from Bubble Chambers—V. Ya. Almazov, *A. S. Burov, A. A. Goryainov, V. I. Zaitsev, V. D. Inkin, Yu. A. Karzhavin,* M. A. Liberman, V. D. Neustroev, V. Ya. Rubtsov, I. I. Skryl', and A. I. Staroverov	1398	36
Use of Spark Chambers for Studying the Characteristics of Charged-Particle Beams—A. V. Arefiev, Yu. D. Bayukov, Yu. M. Zaitsev, L. N. Kuleshova, and G. A. Leksin.	1400	37
Filmless Optical Method for Obtaining Rapid Information from Spark Chambers—N. V. Alekseev, A. P. Meshchanin, S. B. Nurushev, G. A. Chuntonov, and A. P. Yablokov	1403	40
Datum Markers for Spark Chambers—B. I. Bekker and É. S. Belyakov	*1406*	*42*
Simulation of the Track of a Charged Particle in a Spark Chamber—A. O. Agan'yants	1408	43
Aging of Plastic Scintillators Based on Polystyrene—L. Ya. Zhil'tsova, E. N. Matveeva, M. N. Medvedev, O. G. Rubina, and I. M. Stoletova	1410	45
Container for Cooled Scintillation Crystals—N. I. Adamovich, Yu. A. Vorob'ev, V. I. Zuev, and T. F. Pavlovskaya	*1414*	*48*
Multilayer Ionization Chamber with Central Collector—Yu. P. Popov and M. Stempinskii	1416	49
Fast Ionization Chamber for Fission—V. N. Kononov, A. A. Metlev, E. D. Poletaev, and Yu. S. Prokopets	1419	51
Transit Resonance Counter Based on SnO_2—A. S. Chursin, E. B. Karev, and N. I. Rokhlov	*1424*	*56*
Highly-Efficient Neutron Detector—B. S. Ishkhanov, I. M. Kapitonov, E. V. Lazutin, *I. M. Piskarev, and O. P. Shevchenko*	*1427*	*59*
Statistical Error in the Measurement of the Counting Rate of a Gas-Discharge Counter having a Pulsed Power Supply—*A. S. Volkov*	*1430*	*61*
Limits of Measuring Exposure Dose Rate with Gas-Discharge Counters—E. P. Kondrasheva, A. I. Filatov, and *V. G. Chaikovskii*	*1432*	*63*
Variation of the IKS Thermoluminescent Dosimeters with Hardness—I. A. Bochvar, *T. I. Gimadova, I. B. Keirim-Markus, and N. A. Sergeeva*	*1436*	*66*
ELECTRONICS AND RADIO ENGINEERING		
Use of the AI-256 Amplitude Analyzer for Multivariate Analysis—N. N. Balamatov and B. I. Goryachev	1440	69
Intermediate Memory System with Counter-Type Registers for Analysis of Time Distribution of Events—A. E. Samsonov and I. V. Shtranikh	1444	72
Use of P2113 Integral Circuits for Control of HPD Measuring Stage—T. G. Yakovleva, M. I. Popov, and A. A. Ivanov	1447	74
Automatic Reset and Start of a Counter—V. I. Man'kovskii and V. M. Semenikhin	1450	77
Tunnel-Diode Counters of Higher Reliability—V. S. Eletskii and A. I. Repin	1452	79
Paraphase Step Voltage Shaper—L. V. Derbunovich and A. A. Proskurov	1455	81
Diode Switching Element in a Code-to-Voltage Converter—N. N. Butorin	1459	84
Nanosecond Pulse Generator—A. P. Budennyi and A. A. Shishkevich	1461	85
Pulse-Train Generator—V. A. Chegorinskii and O. N. Chegorinskaya	1464	88
Radio-Frequency Pulse Generator with Transistors—M. V. Korolev	1466	89
Timing Marker Generator—K. M. Lekishvili, A. A. Dzidziguri, O. L. Khazaradze, and G. S. Gedevanishvili	1468	91
Logarithmic Pulse Signal Converter—Yu. B. Popov	1470	92
Formation of a Controlled Series of Pulses—V. V. Arkhovskii and A. A. Nesirov	1472	94
Division of the Frequency of Pulses by a Synchrophase LC Oscillator—V. B. Sher and Z. M. Kanevskii	1475	96

	Engl./Russ.	
Automatic Measurement of the Operating Threshold of a Thyristor – A. P. Savrukhin	1477	98
Oscillographic Recording of the Shape of Short Radiation Pulses – V. A. Aleksandrov, V. M. Gerbachev, V. N. Korolev, and L. D. Usenke	1480	100
Cathode-Ray Null Indicators for Compensation Measurements of Pulse Voltages – S. I. Pavlov and G. M. Topchiev	1484	103
Use of a Field-Emission Diode to Measure Small Variations of a Pulse-Top Voltage – A. A. Dul'zon, G. A. Mesyats, and G. N. Fursei	1487	105
Wideband Semiconductor Electrometer Amplifier – A. V. Parshin	1490	107
Transistor Low-Noise Preamplifier for Semiconductor Detectors – F. M. Kulakov	1493	110
Amplifier with Logarithmic Amplitude Response – P. P. Yushkov	1499	115
Precision Analyzer for the Very-Low-Frequency and Low-Frequency Spectrum – V. A. Vlasenko, G. I. Lentukhov, and Yu. K. Filipskii	1501	117
Display of Volt-Capacitance and Volt-Ampere Characteristics – Z. Abbyasov, V. A. Shevaldin, and A. S. Maksimov	1504	119
Photodiode Circuit for Detecting Small Changes in Intense Light Signals – L. G. Paritskii and A. B. Fedortsov	1506	121
Quasioptical-Beam Divider – A. N. Akhiezer	1508	123
Use of a Pin in a Waveguide for Measuring the Parameters of Dielectrics at Ultra-High Frequency – Chinmoi das Gupta	1511	125
Phase Fluctuations of the Signal of a Generator with a Traveling-Wave Tube Using a Superconducting Resonator – A. V. Kukushkin and V. S. Nasonov	1514	127
Superconducting Oscillating Circuit with Lumped Parameters – L. I. Anan'ev, T. M. Gerasimova, N. P. Gerasimov, V. P. Golubkov, E. P. Krasnoperov, and N. M. Reinov	1517	130
Simple Pulse Nuclear Magnetic Resonance Spectrometer – V. V. Kurenev, A. I. Maklakov, and B. G. Tarasov	1519	131
Automated Apparatus for Measuring the Parameters of Ferromagnetic Resonance – G. A. Petrakovskii, I. K. Pukhov, V. N. Seleznev, and A. I. Drokin	1522	133
Wide-Range Precision dc Stabilizer for Galvanomagnetic Measurements – A. A. Gorbatov and E. G. Rudashevskii	1526	137
Stable Voltage Sources up to 150 kV – A. M. Gulyi, M. I. Tregubov, and O. V. Meleshko	1529	140
Investigation of a Compensation-Type Current Stabilizer Tube – É. I. Kaftanenko and V. V. Polivanov	1532	143
Narrow Pass Band and Blocking Filter for a Frequency of 50 Hz – S. K. Gracheva and V. A. Timofeev	1535	145
GENERAL EXPERIMENTAL TECHNIQUES		
Mass Spectrograph for Analyzing Small Impurities in Solids – N. I. Leont'ev, K. G. Ordzhonikidze, Ya. R. Abas-Ogly, A. S. Voznyuk, O. A. Samadashvili, M. P. Khreshtagyan, G. G. Sikharulidze, A. E. Zelenin, S. A. Aboyan, A. I. Martynov, and V. M. Glinskikh	1537	147
Precision Laboratory Mass Spectrometer with High Resolving Power – B. B. Leporskii, V. L. Deshkevich, V. I. Kazakov, É. I. Zaletskii, L. N. Volgin, and Yu. V. Bezmaternykh	1541	151
Silica Gel Trap for Producing Carbon-Free Vacuum – V. M. Azhazha, V. S. Pavlov, and V. V. Sivokon'	1545	154
High-Vacuum Trap with Independent Micro-Cooler – V. E. Minaichev and V. M. Zykov	1547	156
Relaxation Electrical Discharge Vacuum Gage Converter – A. A. Potsar and V. P. Ledovskoi	1550	159
Small-Dimension Wide-Range Ionization Vacuum Gage – T. V. Koroleva and E. A. Penchko	1552	160
Wide-Band Molecular-Velocity Selector – A. M. Zatselyapin	1555	163

Ejecting a Beam of Accelerated Electrons from a Vacuum—E. A. Abramyan and I. L. Chertok 1557 164
Self-Igniting Discharger for Formation of High-Voltage Pulses—N. S. Grigalashvili, A. K. Dzhavrishvili, and V. N. Roinishvili 1559 166
Method of Vaporizing Silicon without a Crucible—V. E. Kosenko and A. V. Stadnik 1561 167
Differential Method for Determining the Thickness of Thin Films with Two Quartz Generators—O. M. Sorokin 1563 168
Feeding of Photomultipliers with Microsecond Pulses—E. I. Shubnikov, V. I. Markov, and F. M. Subbotin 1565 170
Lasing in a Dye Solution by Pumping Liquid through the Active Zone—A. N. Rubinov and I. M. Korda 1569 174
Research on Single Pulse Generation with a Controllable Film—Liquid Shutter —A. V. Gorlanov, V. V. Lyubimov, and V. F. Petrov 1571 176
Adjustable Electrooptical Ultra-High Frequency Light Modulator—R. A. Kazaryan, É. S. Vartanyan, and R. G. Manucharyan 1573 178
Efficiency of a Low-Pressure Pneumatic Mounting—M. M. Butusov and Yu. G. Turkevich 1575 179
Silicone Compounds for Optical Contact—R. P. Antonov, D. Ya. Zhinkin, G. K. Korneeva, N. E. Rodzevich, E. A. Semenova, V. N. Timoshina, D. A. Uklonskii, and V. S. Chukin 1577 180
Film-Type Hall Transducers for Measuring Strong Magnetic Fields—V.G. Veselago, M. V. Glushkov, V. M. Ivanov, and S. G. Shul'man 1580 182
Chamber for Studying the Influence of Pressure up to 35 kbar and Temperature up to 1500°C on the Conductivity of Solid Dielectrics—A. B. Slutskii 1582 183
Measurement of High Pressures in Hot Chambers—L. F. Vereshchagin, E. V. Zubova, Yu. S. Konyaev, and A. V. Dovbnya 1584 185
Temperature Measurement by Diamond Indicators—V. A. Nikolaenko, V. I. Karpukhin, and S. I. Alekseev 1586 187
Device for Deep Cooling Objects under the Electron Microscope—E. V. Darinskaya and V. N. Rozhanskii 1589 190
Determination of the Electrical Conductivity of Semiconductors by the Resonator Substitution Method—D. V. Iremashvili, N. I. Leont'ev, G. M. Mailov, and K. N. Melina 1591 191
Method of Measuring the Faraday Effect in Semiconductors—Yu. A. Makhalov 1593 193
Dependence of the Resistance of Nonrectifying Contacts on the Temperature and Impurity Concentration in Gallium Arsenide—V. P. Duraev, V. I. Shveikin, Yu. D. Chistyakov, and M. K. Pugach 1596 196
Preparation of Electroluminescent Silicon-Carbide Diodes and Digital Indicators —O. T. Sergeev and V. I. Trofimov 1598 197
Positioning Stands with Remote Control—I. V. Naumov, M. G. Zemlyanov, and Yu. M. Krasnikov 1601 200
Preparation of a Thin Target with a Large Surface Area—I. Tomikova 1604 202
Preserving Liquid Helium during Space Flight—A.B. Fradkov, V. F. Troitskii, G. N. Mikhailova, N. N. Inozemtsev, and V. V. Svistel'nik 1607 205
Water-Soluble Epoxide Glue for Scintillation Counters—L. A. Permyakova 1609 207

ABSTRACTS

System of Programmed Reliable Connection for SDS-1604A and Minsk-22—N. N. Govorun, I. M. Ivanchenko, and I. I. Shelontsev 1611 208
Recording System and Data Input in Experiments with a Linear Accelerator of 2 GeV —V. F. Chechetenko, Yu. P. Antuf'ev, and P. V. Sorokin 1612 209
Capture of 100-MeV Electrons in a Storage Ring—Yu. N. Grigor'ev, O. G. Il'in, A. A. Rakityanskii, and A. M. Shenderovich 1614 210
Automatic Focusing with a Tracking Rectifier for an Electrostatic Accelerator —V. P. Yakushev, V. A. Nikitin, and A. N. Serbinov 1616 211

Using the AI-100 Analyzer for Storage of Data from a Precision Coding Instrument —V. V. Marchenkov, A. P. Nekhai, and V. A. Tret'yakov 1618 212
Proportional Counter for Electrons with Energies in the Range 3-10 keV—E. P. Savinov and V. N. Shchemelev 1620 213
Hypersonic Spectrometer for Investigating Acoustic Paramagnetic Resonance —E. M. Ganapol'skii 1622 214
Noise-Free Ionization Converter to Range of 10^{-7} to 10^{-3} Torr—V. T. Grinchenko 1624 215
Use of External Electrostatic Shield to Reduce Photomultiplier Noise—G. M. Barenboim and A. M. Kudasheva 1626 216
Multichannel Velocity Registration of Radiation Spectra of a Laser-Jet High-Temperature Plasma—L. I. Andreeva, N. G. Basov, V. A. Boiko, M. I. Vanina, S. M. Zakharov, O. N. Krokhin, G. V. Sklizkov, B. M. Stepanov, V. N. Filinov, and V. P. Churakov 1628 217
Low-Temperature Detectors for Long-Wavelength Infrared Spectral Instruments —L. V. Berman, A. G. Zhukov, K. K. Rychkov, and V. I. Smirnov 1630 218

REVIEWS OF INSTRUMENTS

Using the AI-256-1 Analyzer in a System for Parallel Recording of Several Spectra —A. É. Melenevskii, O. F. Nemets, and V. N. Nemykin 1632 219
Logarithmic Attachment and Voltage Stabilizer for the MF-4 Microphotometer—V. I. Chirkov, A. F. Neermolov, G. V. Kononova, and É. A. Gal'tsova 1634 220

NEW INSTRUMENTS 1634 222

INDEX

Author Index, Numbers 1-6, 1969. 1643
Tables of Contents, Numbers 1-6, 1969. 1653